

# KWAZULU-NATAL PROVINCIAL BROADBAND STRATEGY

### **Executive Summary**

The KwaZulu-Natal Provincial Government has identified the critical role that broadband will play in the future economy and society of the province. In line with the province's ICTe cluster strategy a broadband strategy has been developed that will support the socio economic objectives of the province as expressed in the Provincial Growth and Development Strategy and in the Industrial Development Strategy. An accompanying document called the KwaZulu-Natal Broadband Action Plan outlines the actions to be taken in response to this strategy.

The following table lists the KwaZulu-Natal provincial initiatives in which broadband will play a role.

### Table <sup>1</sup>: Current provincial programmes influenced by broadband

ICTe cluster strategy (Especially, technology parks programme, incubators and ICT Labs) Trade and logistics programme Dube Trade Port Film and music industry Cultural and heritage programmes Local Business Support Centres (LBSC) Digital community hubs and telecentres programmes Agri-business sector

The mission of the broadband strategy is to ensure the proliferation, adoption and utilisation of broadband infrastructure and applications in support of provincial initiatives and strategies intended to position KwaZulu-Natal as the socio-economic leader in South Africa.

The strategy is based on a future vision for Broadband in KwaZulu-Natal:

### Broadband Vision: By 2012:

- 1. KwaZulu-Natal will be the leading province in broadband infrastructure availability and adoption.
- 2. The Government of KwaZulu-Natal leads South Africa in the utilisation of broadband-enabled applications to address socioeconomic challenges.
- 3. KwaZulu-Natal is the leader in logistics and supply-chain management <sup>1</sup>.

This vision will be attained by pursuing five objectives, to be realised by 2012:

<sup>&</sup>lt;sup>1</sup> leveraging 1 and 2

### **Broadband Objectives**

- 1. Establish state of the art broadband backbone infrastructure and connections into and and out of the province
- 2. Facilitate the establishment of high capacity open access broadband networks
- 3. Harness the potential of broadband for improved quality of life through applications in health, education and crime prevention
- 4. Leverage broadband for economic development
- 5. e-Inclusion to ensure equitable access to broadband and to reduce the digital divide

These strategic objectives will be reached through implementation of the following 11 interventions:

### **Broadband Interventions**

- 1. Broadband implementation project office
- 2. Provincial broadband backbone programme
- 3. Open access broadband network programme
- 4. Broadband to the home programme
- 5. National engagement programme
- 6. Cyberinfrastructure programme
- 7. Broadband flagships programme
- 8. Innovate with broadband for IDS programme.
- 9. Dube Trade Port broadband programme
- 10. Skills programme
- 11. E-inclusion programme
- 12. Measurement programme.

The interventions themselves will be based on a set of principles, the chief of which is: The KwaZulu-Natal Provincial Government considers broadband as essential infrastructure for socio-economic development (in the same way as it considers road infrastructure, electricity, etc.)

Implementation of the strategy will be monitored against annual targets, developed by the project office, based on some key dimensions: availability; competition; affordability; quality; uptake; e-inclusion; and a number of qualitative assessments.

The strategy will place KwaZulu-Natal at the forefront of broadband infrastructure in support of socio-economic development in South Africa.

# **Table of Contents**

	Executive Summary 2	2
1	Introduction5	j
2	Strategic Context	5
	2.1       Socio-economic context.       8         2.2       Alignment with existing provincial strategic plans.       8         2.3       National context and alignment.       9         2.4       The key issues and sectors in KwaZulu-Natal.       11         2.5       The role of provincial and local government.       12         2.6       Conclusion.       12	} } 2 3
3	Broadband Vision and Objectives for KwaZulu-Natal14	ł
	3.1 Broadband Vision.       14         3.2 Broadband Objectives.       14         3.2.1 Objective 1: establish state of the art broadband backbone infrastructure and connections into and and out of the province.       14         3.2.2 Objective 2: facilitate the establishment of high capacity open access broadband networks.       14         3.2.3 Objective 3: harness the potential of broadband for improved quality of life through applications in health, education and crime prevention       16         3.2.4 Objective 4: leverage broadband for economic development       16         access to broadband and to reduce the digital divide.       16	1 1 4 5 n
4	Broadband Implementation	7
	4.1 Implementation principles	7 7 0
	5 Targets Measuring	
	Progress	
	Appendix A – International Broadband Strategies23	3
1	Appendix B – Summary of Broadband Best Practices	7

# 1 Introduction

Access to ICT is an essential enabler of economic growth and social inclusion. Broadband connectivity forms a significant part of ICT development. Broadband has benefits for various sectors in the economy and can contribute to improved quality of life including through improvements in Education, Health, Agriculture, Government service delivery and by supporting SMMEs and other businesses in areas such as tourism, entertainment, agriculture, manufacturing etc.

Many countries, e.g. Ireland, recognise some degree of failure of existing market-led and government initiatives to properly address pervasive broadband connectivity in the near-term. These countries have, consequently, devised specific broadband strategies. These strategies are also aimed at promoting trade and attracting foreign investment; e.g., countries such as Chile, the Netherlands and Finland actively publicise their broadband achievements with this in mind<sup>2</sup>.

In response to global and local trends, the KwaZulu-Natal provincial authority has embarked on the development and implementation of a *Provincial Broadband Strategy* and *Action Plan*. The strategy and action plan is aimed at accelerating KwaZulu-Natal's economic competitiveness and contribute to improved quality of life of the residents of the province. The KwaZulu-Natal Broadband Strategy is a dependent strategy that is informed by the National Information Society Framework.

The KwaZulu-Natal Broadband Strategy will create the framework for a provincial broadband initiative that is key to the long-term competitiveness of the provincial economy. The strategic horizon for this strategy is set to five years. The strategy and action plan will work towards improvement of innovation, economic productivity and competitiveness and enhanced delivery of learning, health care and public services.

The intended beneficiaries include the research community, small medium and micro enterprises (SMMEs), the general population, foreign investors, the ICTe and other sectors and the provincial and local governments of the province. In particular, it needs to leverage existing investments in economic development projects such as the Dube Trade Port, and the new international airport.

Broadband may simply be defined as high speed digital communications over a distance. The ITU<sup>3</sup> defines minimum broadband speed as greater than 1.5 Mbps while the OECD defines the minimum speed at 256 kbps. The latter definition means that 3G coverage of the cellular operators is broadband, while the ITU definition would exclude 3G. The term broadband is often used as a term of contrast, e.g. contrasted with dial-up modem speeds of around 56 kbps. Most electronic communication in South Africa is currently not broadband. This strategy assumes minimum broadband speeds of at least 256 kbps.

Telecommunications forms the basis of the information society. Broadband technology is, in the same way, critical for the information society development because it has the potential to establish a new level of efficiency and dynamism within the fabric of the society and economy<sup>12</sup>. A successful conversion to a knowledge society and a knowledge economy is a key necessity to ensure the sustainable growth of KwaZulu-Natal. Broadband technology will play a crucial role in this conversion.

Broadband has been identified as an important driver of innovation. It is increasingly seen as a necessary component of the structural conditions required for innovation potential. In one of the most comprehensive surveys of innovation performance, the

recommendation I.113

<sup>&</sup>lt;sup>2</sup> Broadband connections in Finland are among the cheapest in Europe

http://www.investinfinland.fi/news/2006/en\_GB/1138694221720/, Ntherelands Foreign Investment Agency, Broadband Penetration of Dutch Households Tops 40% Mark

http://www.nfia.com/item.php?newsid=112, Chile Forein Investment Committee, A Wired Country,

http://www.foreigninvestment.cl/index/plantilla3.asp?id\_seccion=7&id\_subsecciones=33 3 ITU

European Innovation Scoreboard, *Broadband penetration rate* (number of broadband lines per 100 population) along with, *Level of Internet access of Enterprises* and *Level of Internet access of Households* are used as Innovation Driver Indicators.<sup>3</sup>

Broadband is recognized as a key driver of economic growth<sup>4</sup>, making major contributions in terms of economic value added and wealth created in much the same way as previous revolutionary network technology, such as: the development of railway, electricity, telephone, road and highway systems; the airline industry, energy pipelines; and, cable or satellite television and video distribution.

Broadband is particularly critical in rural areas, where advanced communications can shrink the distances that isolate remote communities. The ability to move and exchange large amounts of information at great speed increases productivity, facilitates commerce, and drives innovation. It is changing how individuals and business communicate, and how and where work is done.

Broadband plays a significant role in achieving the Millennium Development Goals (MDGs) as indicated in Table 2.

Goal/Target	Role of ICTs & Broadband	
1. Eradicate extreme poverty	Increase access to market information and reduce transaction costs for poor	
and hunger	farmers and traders, enable logistics, impove access to markets and	
	suppliers	
2. Achieve universal primary	Increase supply and reach of trained teachers through ICT-enhanced	
education	distance training and provide access to e-learning	
3. Promote gender equality and	Deliver educational and literacy programmes specifically targeted to poor	
empower women	girls and women using appropriate technologies. Empower woman and	
	girls through enhanced ability to communicate, network and organise.	
4. Reduce child mortality	Increase access of rural care-givers to specialist support and remote	
5. Improve maternal health	diagnosis Enhance delivery of basic and in-service training for health	
6. Combat HIV/AIDS, malaria,	workers Increase monitoring and information-sharing on disease and	
and other diseases	famine.	
7. Ensure environmental	Remote sensing technologies and communications networks permit more	
sustainability	effective monitoring, resource management, mitigation of environmental	
	risks	
8. Develop a global partnership	"In cooperation with the private sector make available the benefits of new	
for development	technologies, specifically information and communications."	

Table 2: Broadband's contribution to achieving the MDGs<sup>5</sup>

The diffusion of innovations in network technology generally have greater magnitude and variety in their influence than predicted at the time of their introduction. The introduction of GSM based cell phone technology in South Africa is a good example; it was initially expected to have a small niche market but ended up being quite pervasive and of significant socio-economic importance. The innovations that will result from broadband are difficult to predict. Just as no one could have predicted modern spreadsheets when personal computers were introduced, or the development of the World Wide Web when the Internet became more widespread, it is likely that pervasive computing enabled by broadband will lead to other innovations that are as revolutionary as spreadsheets or the Web.<sup>4</sup>

Research infrastructures, also termed "cyberinfrastructure"<sup>11</sup>, play an increasing direct and indirect role in the advancement of knowledge and technology and their exploitation. For example, data banks in genomics, data banks in social science,

<sup>&</sup>lt;sup>3</sup> Maurizio Sajeva, Debora Gatelli, Stefano Tarantola and Hugo Hollanders, *Methodology Report on European Innovation Scoreboard 2005, European Trend Chart on Innovation*, European Commission, Enterprise DirectorateGeneral

<sup>&</sup>lt;sup>4</sup> MRobert W. Crandall and Charles L. Jackson, *The \$500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access*, July 2001

<sup>&</sup>lt;sup>5</sup> Adpated from Michael Minges, *Information and Communication Technologies & the Millennium Development Goals*, Telecommunication Development Bureau, International Telecommunication Union

observatories for environmental sciences and development of new materials or nanoelectronics, are at the core of research and innovation processes; they represent significant advances in tackling key issues such as health care and advanced industrial development.

Cyberinfrastructure helps structuring the scientific community and therefore plays a key role in the construction of an efficient research and innovation environment through the following: offering access to unique research services to users from different geographic contexts; by attracting young people to science; and, through networking of facilities - such as the Centre for High Performance Computing.

Cyberinfrastructure is at the core of the knowledge triangle of research, education and innovation. Because of their ability to assemble a 'critical mass' of people and investment, they contribute to provincial, regional, national, and even continental economic development and impact positively on quality of life issues.

The development of an approach with regard to cyberinfrastructure (including computing and the critical component of broadband communication based *e*-

infrastructures), and the carrying out of activities in this area at a provincial level, will make a significant contribution to boosting the provincial research potential and its exploitation. In addition, it has been shown internationally, that the spin-off effects of these cyberinfrastructure efforts have a direct positive influence on broadband rollout and industrial development.

In terms of *smart cities*, *intelligent communities* and related concepts, the competitiveness of a city or community depends in part on requisite broadband infrastructure. Smart cities pro-actively develop clear visions and put in place effective public policies and strategies that enable affordable and equitable access to broadband infrastructure. In the industrial era, buildings and neighbourhoods acquired increasingly sophisticated systems for water and energy supplies, sewage, ventilation, transportation, and refuse removal. Similarly, in the knowledge era, advances in broadband infrastructure and other areas (e.g. miniaturisation and sensor technology) will lead to radical changes that will see cities become smarter; broadband will enable an artificial nervous system allowing cities to act in intelligently coordinated ways<sup>6</sup>.

In KwaZulu-Natal, the eThekwini metro has identified the need to find affordable and accessible ways of enabling the kinds of innovation that will ensure progress through to 2010 and beyond. Pervasive access to infrastructure is needed to support accelerated economic growth in the city. Projects have been put in place to establish and extend the infrastructure that will be the basis of the next generation efficient city. These initiatives are aimed at supporting the city's vision to become a learning, healthy, prosperous, efficient, citizen-centric and safer city<sup>8</sup>

# 2 Strategic Context

### 2.1 Socio-economic context

KwaZulu-Natal is particularly dependent on its linkages with the global economy, because of the dominance of trade, transport and manufacturing in the provincial economy. It has a disproportionately high share of South Africa's manufacturing sector and is home to the most important logistics platform for South Africa's trade.

<sup>&</sup>lt;sup>6</sup> Smart City 2020 Emerging technologies are poised to reshape our urban environments <u>http://www.metropolismag.com/cda/story.php?artid=1848</u> <sup>e</sup> Project Charter Document, Project Name: Moet, May 2006

KwaZulu-Natal is the second largest contributor to the South African GDP after Gauteng (at about 17% compared to about 34% for Gauteng in 2004). KwaZuluNatal is the most populous province in South Africa, with a high level of unemployment (though improving from 36.3% in 2003 to 29.9%<sup>7</sup> <sup>8</sup>in 2006). It has severe income inequality that is worsening each year and the highest prevalence of HIV of 16.5%<sup>9</sup> in those aged two and above in the country.

In terms of building human capacity for economic competitiveness, the schools' situation provides concern as 75% of its schools are without computers, 60% without electricity and 53% do not even have a telephone.

KwaZulu-Natal had 61 municipalities, 10 district councils and a Metro in February 2007. Development and economic activity is not evenly spread between the districts of the province. Economic activity and KwaZulu-Natal's population is concentrated in the main urban areas of Durban/eThekwini, Pietermaritzburg/Msunduzi (within the UMgungundlovu District) and Richards Bay (within the Uthungulu District); these three areas account for approximately 84% of KwaZulu-Natal's GGP. Just over a third of KwaZulu-Natal's population and 60% of its economic activity is concentrated in Durban.

### 2.2 Alignment with existing provincial strategic plans

To address this socio-economic context, the KwaZulu-Natal Provincial Growth and Development Strategy (PGDS) of 2004 identified the following provincial priorities:

- Strengthening governance and service delivery;
- Sustainable economic development and job creation;
- Integrating investments in community infrastructure;
- Developing human capability;
- Developing a comprehensive response to HIV/AIDS; and
- Fighting poverty and protecting vulnerable groups in society.

A key element of the KwaZulu-Natal Provincial Growth and Development Strategy is the Industrial Development Strategy (IDS). The IDS sets out the short to medium term programmes to address the challenges facing the province in moving from its current state towards the desired positioning of the KwaZulu-Natal economy, i.e.:

- Optimisation of the province as a trade and logistics hub serving the province, country and region
- Clusters of world-class agriculture and high value manufacturing
- Excellence in business and creative services; in particular ICT, trade and financial services, film, music and media

<sup>&</sup>lt;sup>7</sup> State of the Province Address by the Honourable Sibusiso Ndebele, Premier of KwaZulu-Natal (KZN) province <sup>8</sup> 7-02-14. Available online: http://www.polity.org.za/pdf/State%20of%20KZN.pdf

<sup>&</sup>lt;sup>9</sup> HSRC (2005) Factsheet 2 : National HIV prevalence in South Africa - the graphics. Available online: http://www.hsrc.ac.za/Factsheet-40.phtml

- Promotion of the region as a competitive destination for both domestic and international tourists
- Greater integration of all human resources and geographical areas into these activities
- Strengthening and retaining creative and commercial design capacity and technologies to support this positioning

As this broadband strategy is a dependant strategy, it is aligned with the other strategic plans of the province.

### 2.3 National context and alignment

KwaZulu-Natal's broadband situation fits within the national context which is not excellent when compared to global leaders (in a globalised world, every country competes with the leaders in every economic area). The following points are illustrative of South Africa's general competitive weakness:

- South Africa remains limited in terms of broadband penetration (as shown in Figure 1); a number of factors including policy, regulation and supply are responsible for this situation. In addition, the existence of a monopoly operator, until very recently, has limited the supply of meaningful and affordable broadband to users.
- Affordability is a key issue. Ironically, Figure 2 shows that a relatively poor country like South Africa still has very high broadband costs.

In KwaZulu-Natal, the major urban areas have access to ADSL and about 14 of the major towns have wireless broadband connectivity of some sort; this compares poorly with the situation in Gauteng which is the province's chief domestic competitor.



# Broadband Subscriptions per 100 Inhabitants



Figure 1: Top 20 broadband economies<sup>10</sup>



# Figure 2: Relative affordability of broadband (indicative only)<sup>11</sup>

There are a number of national plans, initiatives and developments that have impact on this strategy:

- Electronic Communications Act of 2005 which will promote convergence of broadcasting and telecommunications sectors and introduce greater competition in the provision of converged services.
- National Broadband Strategy (under development) which will formulate a five -year broadband strategy for South Africa. The KwaZulu-Natal broadband strategy pre empts the national strategy, but ultimately should complement this national strategy.

<sup>&</sup>lt;sup>10</sup> Source: ITU-D, ITU Research Centre

<sup>&</sup>lt;sup>11</sup> Source: ITU-'The Portable Internet', ITU Research Center

- Information Society and Development Plan (adopted February 2007) as a framework for building an inclusive information society in South Africa
- Free and Open Source Software (FOSS) policy in government (adopted February 2007) seeks to migrate all government departments to OSS systems and open document formats. This will impact the types of systems that will be broadband-enabled in KwaZulu-Natal.
- **FIFA 2010 world cup**: The Department of Communications is developing a specific ICT strategy for the world cup.
- **Neotel** is the second fixed line network operator to be licensed in South Africa after Telkom. Retail services will be provided to the metropolitan areas first. Durban, Richards Bay and Pietermaritzburg are seen as points on Neotel's national network.
- Infraco is a government owned entity created to reduce broadband costs in South Africa. Infraco will have two phases: the first phase will be the creation of a national long distance backbone; and, the second phase will be a submarine cable for international connectivity. The two phases address the two main areas responsible for high broadband prices in South Africa. The national long distance backbone is expected to be operational by April 2007.
- SANReN (South African National Research Network) will inter-connect, at high speeds to research networks globally - via connections to Géant in Europe (and possibly also to Internet2 in the USA), the following: research councils; other research institutions or facilities within statutory bodies, government departments and elsewhere; and, the universities,
- **EduNet** is an education network designed to serve the goal of universal access for every e-school. EduNet will provide high-speed access for learning, teaching and administrative use.

### 2.4 The key issues and sectors in KwaZulu-Natal

The IDS identifies the following programmes in relation to priority cross-cutting issues:

- Logistics and transport
- Black and women's economic empowerment
- Small enterprise development
- Export development/support
- Technology, R&D and innovation

In addition to the cross-cutting programmes the following priority sector/ value chain programmes have been identified:

- 1. High value agriculture, agro-and food processing and biotechnology
- 2. Clothing and textiles

- 3. Wood and wood products
- 4. ICT and electronics
- 5. Creative industries, including film, music and media
- 6. Crafts

Broadband infrastructure can support both the cross-cutting issues as well as the priority sectors. Broadband can, for instance, support: the marketing of KwaZuluNatal organic produce; industry structure and cooperation; and, training in the high value agriculture, agri- and food-processing and biotechnology sector.

Broadband can benefit the following:

- the clothing and textiles sector through design (and design-services) and marketing of the sector;
- wood and wood products sector through market information and understanding of market dynamics;
- the creative industries through improved access to audiences and markets as well as resources and infrastructure that supports the movement of huge amounts of data associated with the industry internally and externally to the province;
- crafts through integrated market access, marketing and distribution; and
- Technology, R&D and innovation through roll-out of ICT infrastructure and regional connectivity.

### 2.5 The role of provincial and local government

The national government and its agencies wield most of the regulatory and legislative levers that ultimately influence the roll-out of broadband in KwaZulu-Natal. The provincial government may be able to stimulate the development and uptake of broadband in the province; for this, it will have to work closely with the local government bodies within KwaZulu-Natal, the Department of Provincial and Local Government and the South African Local Government Association.

#### 2.6 Conclusion

KwaZulu-Natal has many socio-economic challenges for which the province has developed strategies. This broadband strategy is intended to assist the existing strategies and operates within the limited power of the province to influence broadband roll-out. As the province's strategy pre empts the national broadband strategy, it is vitally important that this strategy prepares KwaZulu-Natal to complement and fully exploit national initiatives in this regard.

### **3** Broadband Vision and Objectives for KwaZulu-Natal

The KwaZulu-Natal Broadband Strategy and Action Plan will create the framework for a provincial broadband initiative that is key to to the long-term competitiveness of the provincial economy. The strategy and action plan will work towards improvement of innovation, economic productivity and competitiveness and enhanced delivery of learning, health care and public services.

The intended beneficiaries include the research community, small medium and micro enterprises (SMMEs), the general population, foreign investors, the ICTe and other sectors and the provincial and local governments of the province. In particular, it will leverage existing investments in economic development projects, such as the Dube Trade Port, and the new international airport.

### 3.1 Broadband Vision

The mission of the broadband strategy is to ensure the proliferation, adoption and utilisation of broadband infrastructure and applications in support of provincial initiatives and strategies intended to position KwaZulu-Natal as the socio-economic leader in South Africa.

Some specific provincial strategies the broadband strategy will support are: The Provincial Growth and Development Strategy (PGDS) of 2004; the Industrial Development Strategy (IDS); KZN Digital Community Hubs Strategy, KZN ICT SMME Strategy, KZN Skills Development Strategy, KZN e-Education Strategy Strategy.

The vision is:

### By 2012:

- 1. KwaZulu-Natal will be the leading province in broadband infrastructure availability and adoption.
- 2. The Government of KwaZulu-Natal leads South Africa in the utilisation of broadband-enabled applications to address socioeconomic challenges.
- 3. KwaZulu-Natal is the leader in logistics and supply-chain management

#### **3.2 Broadband Objectives**

In order to achieve this vision, a number of strategic objectives have been crafted that will support action towards attaining the vision. The objectives ensure that the key element required to achieve the vision is addressed and will act as guiding framework for the implementation of the strategy.

# 3.2.1 Objective 1: establish state of the art broadband backbone infrastructure and connections into and and out of the province

• A number of national initiatives are under way that aim to establish broadband infrastructure and affordable broadband access. These include the development of the national Broadband strategy, the establishment of Infraco as a broadband infrastructure provider, the establishment of the second network operator, Neotel, establishment of SANREN and Edunet and roll-out of

- broadband services by wireless operators. For KwaZulu-Natal to derive optimal benefit from these initiatives the province has to be prepared and ready to capitalise immediately upon the availability of such infrastructure.
- KwaZulu-Natal needs to become more involved in strategies and implementation initiatives that affect the province. It needs to ensure that the province's broadband needs and priorities are represented in national forums to influence the establishment of a provincial broadband backbone with requisite national and international links.
- The Province needs to pro-actively compensate for areas where national players will not address its needs. This may include infrastructure developments in economically unattractive areas or in areas that are not national priorities but which are important to the province.

### 3.2.2 Objective 2: facilitate the establishment of high capacity open access broadband networks

Knysna: A open access wireless network

Knysna has wireless, open access, broadband network established through a lease and management contract. The project is financed by reallocating a percentage of the operational budget in telecommunications

- Open access broadband networks presents an opportunity to establish affordable broadband access in all KZN. Such networks aggregate demand and leverages investments in backbone infrastructure whilst at the same time allowing healthy competition in last mile connection, services etc.
- Funding and other incentives may be needed for government to establish and initiate operation of open access broadband networks and create an environment where healthy competition will drive the provision of affordable broadband access to homes and businesses.

# 3.2.3 Objective 3: harness the potential of broadband for improved quality of life through applications in health, education and crime prevention

- The provincial authority should lead the application of broadband technology and application to address the socio economic challenges in the province.
- The province's procurement of broadband services to support such applications will act as a powerful driver of demand leading to investment in broadband infrastructure and uptake of broadband

### 3.2.4 Objective 4: leverage broadband for economic development

- Broadband will support all of the cross-cutting programmes and priority sector / value chain programmes identified in the Industrial Development Strategy.
- Trade and logistics, agriculture and high value manufacturing, business and creative services and tourism will all benefit from pervasive affordable broadband connectivity and will lead to greater integration of human resources and geographical areas into these activities.
- The roll-out of broadband should stimulate the development of the ICT sector and in turn benefit from the products and services resulting from the sector.

- Requisite broadband infrastructure is a critical enabler of a regional system of innovation which complements human capital development, R&D, innovation support and other institutional support structures and networks put in place by other strategies.
- Measures should be taken to ensure that when the supply situation is addressed through investments in broadband infrastructure demand is stimulated and the public and business ability to use ICT and broadband is in place.

# 3.2.5 Objective 5: e-inclusion to ensure equitable access to broadband and to reduce the digital divide

- The province needs to enable use of broadband through E-literacy programmes. This will enable readiness and should address skills at different levels
- Public access to broadband infrastructure is required in disadvantaged rural and urban areas

### 4 Broadband Implementation

### 4.1 Implementation principles

Implementation of the Strategy needs to comply with the following principles:

- Foundational principle: The KwaZulu-Natal Provincial Government considers broadband as essential infrastructure for socio-economic development (in the same way as it considers road infrastructure, electricity, etc.);
- Government interventions need to be sustainable, therefore broadband investments must be made such that they will be sustainable<sup>14</sup> by 2012;
- Pro-competitive roll-out of broadband under market arrangements should be encouraged (i.e. broadband suppliers need to become more competitive);
- Government investment in broadband infrastructure should be made available based on open access principles;
- Broadband must count for KwaZulu-Natal (e.g. make business better);
- Broadband needs to provide value for money for the public sector (the cost of providing government services to the population needs to be reduced and expenditure rationalized);
- Broadband infrastructure roll-out will be technology neutral (but implementation should leverage new technology and emerging business models<sup>15</sup>).

### 4.2 Interventions

In support of the objectives outlined in section 3 and in line with the principles above the following interventions are proposed:

- 1. **Broadband Project Office** Establish an office that will drive the implementation of the Broadband Strategy and act as a hub for broadband related activities in KwaZulu-Natal. The office will develop the implementation programmes and strategies in more detail and will facilitate collaboration amongst stakeholders and role players and ensure coordination of various programmes. the project office will also play an important role in disseminating the strategy and creating awareness of the benefits of broadband in the province.
- 2. **Provincial Broadband Backbone Programme.** Facilitate the investment in the necessary backbone infrastructure for broadband. The programme should prioritise the needs of the sectors identified in the IDS and at the same time seek to develop and maintain parity in the price and availability of broadband between rural and urban areas in the province. It will identify and quantify the needs of industry, government and society in more detail and ensure that
- 3. **Open Access Broadband Network Programme.** Facilitate the development of open access broadband networks. A generic reference plan will be developed that makes recommendations on

4. **Broadband to the home programme:** In order to develop the local market for broadband services and maximise the equitable distribution of these services, KwaZulu-Natal needs to develop and encourage innovative ways to address low levels of residential Internet and broadband penetration and time spent on-line. Enhancing this, "at home", access will have direct positive impact on the ability of end-users to engage in activities ranging from education through to consumption and production of knowledge-based services<sup>10</sup>. To encourage and accelerate the residential broadband penetration, innovative ways to integrate physical infrastructure and urban planning with network infrastructure roll-out will be developed. Regulations, business cases, demonstrators and incentives should be developed and promoted for broadband infrastructure integration into construction programmes and new residential developments.

- 5. **National engagement programme**: driven by the project office, KwaZuluNatal should be pro actively involved in national projects and initiatives that affect the province. This includes projects like SANReN and Edunet and building relationships with national stakeholders such as ICASA, the Department of Communications, USAASA and the various operators. The province needs to ensure that its strategies are understood and that its broadband needs and priorities are represented.
- 6. Cyberinfrastructure programme. The development of an approach with regard to research infrastructures, including computing and the critical component of broadband communication based *e*-infrastructures, and the carrying out of activities in this area at a provincial level, will make a significant contribution to boosting the provincial research potential and its exploitation. In addition, it has been shown internationally, that the spin-off effects of these cyberinfrastructure efforts has a direct positive influence on broadband roll-out

<sup>&</sup>lt;sup>14</sup> Note: sustainable does not mean self-sustainable, i.e. that broadband should pay for itself.

<sup>&</sup>lt;sup>15</sup> e.g. Business models and technologies around unlicensed community owned wireless networks.

business model options, reference prices, mechanisms for demand aggregation, the use of unlicensed radio frequency, technology issues and other aspects of setting up open access broadband networks.

and industrial development. The intention is to complement the SANReN and ensure that the universities and also researchers in private and commercial entities who can benefit from a highspeed connection are linked to the SANReN and access to local, national and international research infrastructures, such as the national Centre for High performance Computing.

- 7. **Broadband flagships programme**: commission and / or develop flagship applications in areas such as *Health, Agriculture, Education, Crime Prevention* and *Governance* that will leverage the new broadband infrastructure and allow the province to address critical socio-economic challenges using modern technology. Such applications, along with government procurement of broadband, will stimulate demand with consequent investment in broadband infrastructure and uptake. Efforts will be made to supplement and fast track national initiatives in these areas via special broadband projects (e.g. KwaZulu-Natal broadband for education flagship programme may fast track the implementation of Edunet in KwaZuluNatal and improve its intended capacities).
- 8. Innovate with broadband for IDS programme. Develop and encourage innovative ways to exploit the potential of broadband aligned with the province's IDS in areas such as: trade and logistics, multimedia, music and film production, high value agriculture, agri- and food-processing, biotechnology, clothing and textiles, wood and wood products, ICT and electronics and crafts. Business cases, and demonstrators should be developed and promoted for broadband applications across different industry sectors. Stimulate innovation in all sectors and all clusters e.g. the ICTe cluster especially through technology parks, incubators and ICT labs.
- 9. **Dube Trade Port broadband programme** that specifically provides the necessary broadband infrastructure for the Dube Trade Port and broadband applications that integrate the various aspects of the trade port initiative.
- 10. **Skills programme**. Invest in skills at various levels relevant to broadband. This should range from basic user skills through to advanced PhD level skills that enable the generation of new knowledge. This could include the establishment of a Meraka Institute node in KwaZulu-Natal.
- 11. E-inclusion programme. Specific initiatives for introduction of broadband technology to under-served and disadvantaged communities. One of these initiatives should be a **rural broadband initiative**. The programme should support the establishment of public access points in libraries, community centres and business support centres. This should be done in partnership with national initiatives with similar aims (Digital Doorway project for instance) and provincial initiatives (e.g. the digital community hub and telecentres project). Specific attention needs to be paid to the needs of persons with disabilities (by linking to the National Accessibility Portal project for instance). E-literacy programmes are required to stimulate demand and to realise the potential of ICTs and broadband specifically.
- 12. **Measurement programme**. Establish and monitor supply and demand of broadband access in KwaZulu-Natal. A baseline study needs to be undertaken that will map use and provisions of broadband as well as provide more detail on existing and planned broadband infrastructure. Measurement of KwaZulu-Natal's position relative to other provinces and international benchmarks will be required. Such measurement will serve to monitor implementation progress,

allow adaptation of the strategy and its implementation and enable dissemination of results about progress

### 4.3 Mapping of objectives with interventions

Table 3 indicates how each of the 12 interventions impacts on each of the 5 strategic objectives.

### **Table 3: Impact of Interventions on Objectives**

	Objective 1: Obj	ective 2:	Objectiv	e 3: Obje	ctive 4: C	Objective	5: State of the
	art Open acce	ss Harn	ess Lev	erage e-l	nclusion	broadba	and municipal
	broadband for	broadba	und to	ensure	backbon	e area	improved for
	economic equit	able infra	structur	e netwo	rks qual	ity of life	development
	access						
1. Broadband Project Office		Direct	Direct	Direct	Indirect	Direct	
2. Provincial Broadband Backbone Programme.	Direct	Direct	Indirect	Indirect	Indirect		
3. Open Access Broadband Network Programme		Indirect	Direct	Indirect	Indirect	Direct	
		Direct	Direct	Direct	Indirect	Direct	
to the home programme	Indirect	Indirect	Indirect	Indirect	Indirect		
5. National engagement programme:	Indirect	Indirect	Indirect	Indirect	Indirect		
6. Broadband for research programme.					<b>_</b> .		
7. Broadband	Indirect	Indirect	Direct	Direct	Direct		
8. Innovate with broadband for IDS	Indirect	Indirect	Direct	Direct	Indirect		
programme.	Direct	Indirect	Indirect	Direct	Indirect		
Port broadband programme	Indirect	Indirect	Direct	Direct	Direct		
10. Skills programme.	Indirect	Indirect	Direct	Indirect	Direct		
11. E-inclusion programme.	Indirect	Indirect	Indirect	Indirect	Direct		
12. Measurement programme.							

Table 4 Indicates the level of impact of the 12 interventions on each of the 5 strategic objectives.

### Table 4: Level of impact of Interventions on the Objectives

Objective 1: Objective 2: Objective	3: Objective 4: Objective 5:
State of the art Open access Harness	Leverage e-Inclusion
broadband municipal broadban	<sup>Id</sup> broadband to ensure for
backbone area for improved	economic equitable
	development access

	infrastructure of life	networks	quality		
1. Broadband Project Office	Medium	High	Medium	Low	Medium
2. Provincial Broadband Backbone Programme.	High	High	Medium	Medium	Medium
3. Open Access Broadband Network Programme.	Medium	High	Medium	Low	Medium
4. Broadband to the home programme:	High	High	Medium	Medium	Medium
5. National engagement programme:	High	Low	Medium	Medium	Medium
6. Cyberinfrastructure programme	Low	Low	High	Medium	Medium
7. Broadband flagships programme:	Low	Low	High	Medium	Medium
8. Innovate with broadband for IDS programme.	Low	Low	High	High	Low
9. Dube Trade Port broadband programme	High	Low	Low	High	Low
10. Skills programme.	Low	Low	High	Medium	Medium
11. E-inclusion programme.	Low	Low	High	Low	High
12. Measurement programme.	Low	Low	Low	Low	Medium

### 5 Targets Measuring Progress

Monitoring the implementation of the strategy is a critical success factor for its implementation. A detailed set of year-on-year targets should be developed by the project office using the following dimensions:

- broadband availability including percentage of KwaZulu-Natal covered at different broadband speeds;
- broadband competition the number of broadband players and other measures of the health of the supply side;
- broadband affordability in comparison to the cost in other provinces and international best practice;
- broadband quality reliability and availability of access;
- uptake of broadband number and percentage of households with broadband access, number of businesses using broadband;
- e-inclusion number of persons with disabilities trained, degree / percentage of accessible broadband services;
- Qualitative assessments of:
- use of broadband in education and research

- impact of government programs
- range and use of broadband applications and services
- use of broadband in health
- use of broadband to deliver government services.

The measures should as far as possible be updated and made available as living maps and graphs.

### Appendix A – International Broadband Strategies

As part of this strategy formulation a number of broadband strategies of different countries and regions have been studied. Key aspects of these strategies are summarised in the table below:

Country or region	Vision	Objectives and Targets	Implementation strategies
South Australia	Affordable broadband available to all South Australians by 2008 & daily use for business, research, learning and community life	1.Affordable broadband services available to all2.Household use meets or exceeds national benchmarks 3.Broadband necessary part of doing business.Broadband necessary part of doing business.3.Regional and metropolitan communities securing aggregated demand4.Vigorous and diverse (local & national) broadband marketplace 5. Health and education meet or exceed national benchmark use. 6. All major research sites in connected to national research network through optical fibre.	1.Collaboration and program development:2.Infrastructure development4.Business case develop5.Regional development6.Reduction of Digital divide:Introduce7.7.National representation8.Support innovation (multimedia and film, e-business, highperformance computing, on-line learning, Government on-line services)9.Government procurement to stimulate investment in broadband infrastructure and take-up
Emilia- Romagna	Leverage the development of new technologies as one of the main action lines of all its policies to: create an environment favourable to the development of egovernment for all its public administrations, sustain the economic development of the local enterprises, support the development of information society, and support the growth of initiatives in the field of R&D	<ol> <li>Create a modern communication network for local public administrations to allow for the appearance of innovative information systems with a technology life of (at least) 30 years and the availability of advanced services such as video communication</li> <li>Promote a one-stop-shop approach for communication services for all local PA within the region</li> <li>Make the region as a whole more competitive by improving and easing access to broadband services for businesses and citizens as well - having the telecommunication operators extend the infrastructure (last mile)</li> <li>Reduce the geographical digital divide.</li> </ol>	<ol> <li>"Regional development of Information Society" bill that gives the regional government the role to activate infrastructures and telecommunication networks</li> <li>Governance structure composed by a scientific committee, a legislative -economic committee and a committee for the definition of the policies and co-definition of the policies and co-ordination with all local authorities.</li> <li>Creation of a top level ASP centre aimed at the regional public administrations,</li> <li>Broadband diffusion initiative</li> </ol>

### KwaZulu-Natal Broadband Strategy

South East England	Accelerate the availability, take-up and exploitation of ICT services to benefit the social and economic development of their area	1. Stimulate Supply in Underserved Areas 2. Stimulate and Aggregate Demand 3. Integrate Broadband into Programme Delivery	<ol> <li>Form legal entity that can oversee the deployment and maintenance of a regional broadband network. 2.</li> <li>Procurement of a Joint (WMNet, MidMAN) network</li> <li>Extending Service to New Subgroups and Geographies         <ul> <li>Geographic Extension of WAN Service</li> <li>Subgroup Extension</li> <li>Extend to Rural Areas Using Alternative Technologies</li> </ul> </li> </ol>
<b>Canada :</b> Broadband for Rural and Northern Development Pilot Program	The Broadband for Rural and Northern Development Pilot Program was created to assist those communities without broadband access. Most often, improved access is necessary in First Nations, northern	Improve the quality of life of Canadians and help businesses in rural and remote areas. This is achieved through improved access to e-government and other on-line services, like distance learning and telemedicine.	<ol> <li>1. 154 projects representing 2285 communities funded up to \$30,000 to develop broadband business plans that outlined their vision for the application of high-capacity Internet services (\$4.2 million invested in total).</li> <li>2. Implementation funding for 63 projects representing 900 communities to deploy broadband</li> </ol>

	and rural communities in order to provide services in the areas of health and education, as well as to augment economic opportunities.		services (total investment of \$80 million). Broadband Pilot Program is based on the following four key principles: - Sustainability - Open Access - Commercial and Technological Neutrality - Clear Role for the Private Sector
Finland	High-speed telecommunications with nationwide coverage to support achievement of a welfare society through improving the employment rate, reducing unemployment, enhancing basic services and income security, and promoting balanced regional development.	Objectives of the Strategy: 1. to promote competition within and between all communications networks, 2. to promote the provision of electronic services and content, 3. to stimulate demand for broadband services, 4. to continue and develop special support measures in those areas in which there is insufficient demand for the commercial supply of broadband facilities. The strategy's targets to be achieved by the end of 2005 were(all achieved or exceeded): 1. 1,000,000 broadband connections in Finland (all technologies), 2. everyone has access to affordable, high-speed telecommunications with comprehensive 3. geographical coverage, 4. Finland becomes a European leader in the availability and use of high-speed telecommunications. The strategy's targets to be achieved by the end of 2007 are (all achieved or exceeded): 1. broadband covers more than 90 per cent of Internet connections in Finland and the connection speed of the most widespread broadband service is at least 8 Mbit/s; 2 Finland is one of the world leaders in the use of telecommunications connections.	1.       More competition within and between the different communications networks         2.       Speeding up the introduction and spread of new broadband technologies         3.       Development of electronic transactions and on-line business 4.         Effective participation of businesses and individuals in the information society         5.       Promoting data security and privacy protection         6.       Special measures for regional development (National guidelines for use of public funding for projects to build telecommunications infrastructure, Broadband connections will be provided for schools, Broadband connections will be provided for libraries, Publicly available, free of charge, regional broadband service points equipped with customer terminals         7.       Contributing to and monitoring international developments         8.       Monitoring the strategy         Supported by public funding for the National Broadband Strategy
Ireland	Position Ireland as a world leader for ebusiness and knowledge-based economic activity by placing Ireland is in the top decile of OECD countries for broadband connectivity by 2005. Nurture a knowledge-based society is essential to maintaining and enhancing Ireland's international competitiveness and will allow the country to build on the economic gains of recent years. Grasp the opportunities afforded by the Information Age.	<ol> <li>Availability of open- access, affordable, always-on broadband infrastructure and services for businesses and citizens throughout the State within three years</li> <li>Broadband speeds of 5mbit/s to the home and substantially higher for business users as minimum standard in the medium term</li> <li>Putting infrastructures in place, with Exchequer assistance, to meet the three-year objective, capable of being upgraded to meet the longterm objective</li> <li>Target available funding at procuring open access, local access networks on a Public Private Partnership type basis</li> </ol>	1.Broadband infrastructureinitiative addressing:Infrastructure Roll-out Initiatives, Regional BroadbandProgramme, Broadband Action Plan,Connectivity Framework Deals,Backbone Infrastructure, BroadbandInfrastructure for Education and R&DInternational Connectivity, PowerlineCommunications Systems,Broadband in Clár areas, FuturePlanning Permissions2.Legal and regulatoryenvironment addressing: MarketRegulation, Data Protection,Electronic Commerce,Public Service Identity, ElectronicMoney, Radio Spectrum, Digital Hub,EU Directives on ElectronicCommunications, Network Security,Telecommunications Regulation3.e-business: The Digital Hub4.Lifelong learning: SchoolsInternetconnectivity, e-Inclusion,Coordination and Policy

		Development, Universal Participation
2007-03-12		
2007-03-12	I	
		Initiative, Internet Services Provision for Community & Voluntary Sector,
		empowering communities, employin
		socioeconomic barriers, Capacity
		Accessibility
		Guidelines, Centre of Excellence in Universal Design

### KwaZulu-Natal Broadband Strategy

[			
Korea	Construct a creative, knowledge-based society, increase the share of GDP of the knowledge-based industries to that of the OECD countries by 2002, becoming one of the top ten advanced information societies in the world by the year 2002.	Objectives (older strategies): 1.           Establishing the Information Infrastructure for a KnowledgeBased Society - Upgrading telecommunications networks to broadband standards           2.         Increasing National Productivity by Utilizing the Information Infrastructure - Promoting the globalization/export of operating systems           3.         Creating a safe and sound information culture           4.         Becoming the world's leading computer-literate nation 5.           Creating New Business & Facilitating the IT Industry           6.         Improve the quality of life for the general public. To do this, the government is providing PC units to schools;           7.         Take general steps to ensure the competitiveness of Korean industries as a whole, such as support for the construction of eCommerce system in steel, shipbuilding and other traditional industries;           8.         Establish an electronic document distribution system to be used by administrative bodies.           Broadband IT Korea Vision 2007 objectives:	The Korea Information Infrastructure (KII) initiative was a US\$24.5 billion project, amongst which the government invested US\$1.5 billion. 1. Deregulating the telecoms sector to stimulate the broadband service market in the 'last mile', mainly through market competition and private sector investment. Facilitiesbased Service Providers allowed to enter the market free of entry and price regulation, stimulating competition. 2. £1bn of funding for a new highcapacity backbone network involving an upgrade from Giga bps - Terra bps and deploying broadband services to 30 000 government and research institutes and 10,000 schools 3. Provided government test beds, KII-Test bed or KII-T, that allowed companies to avoid financial risk while encouraging R&D. 4. Public Fund Programme to address the problem of lack of broadband in rural areas - government low interest loans to Facilities-based Service Providers (FSPs) in order to reduce the financial burden of investing in access networks. (1999 US\$77 million, 2000 US\$77 million, 2000 US\$77 million, 2007 US\$77 million, 2000 US\$77 million, 2007 US\$77
		<ol> <li>Improving administrative service processes, efficiency and transparency through open eGovernment;</li> <li>Strengthening international competitiveness through facilitating informatisation in every industry; 3. Implementing an integrated broadband network and developing IT as a new driver for economic growth in order to achieve the target of US\$20,000 national income; and</li> <li>Create a digital welfare society where every citizen can become a leader of the knowledge information society[8].</li> <li>Targets</li> <li>The overriding target of the initiative was to provide FTTH connectivity to all households by 2015. This target has been continually revised and upgraded and the current target is to provide 20Mbps connectivity to all homes by the end of 2010.</li> </ol>	<ul> <li>6. Promotion of Utilizing Information Infrastructure through e- government etc.</li> <li>7. Closing Digital Divide - Enhancing IT literacy: IT training programs for the elderly, disabled, housewives, etc (More than 8.1 million people trained between 2000 and 2002), .,</li> <li>Supporting technology development for the disabled and elderly, Ensuring access to information via Community Access Centers, etc (free internet access was provided in 3,000 public places, such as post offices and community centres.) Educational Broadcasting System (EBS), Promoting ICT Use and Distributing PCs to Children of Low Income Families provides those who can't afford ICT with a PC and discounted internet access[10].</li> <li>8. Minimizing Risks : Safeguarding the Knowledge-Based Information Society Legal Framework, Telecommunications Network Use Proliferation Act, Electronic Signature Act ('99. 2.), Enforcing Mechanisms, Opening Customer Report Center</li> </ul>

### KwaZulu-Natal Broadband Strategy

where people can report privacy infringement ('99. 4.), Operating defense systems such as CONCERT, Cyber 118, etc. 9. IT 839 Strategy – New strategy to establish three new major infrastructures: the Broadband Convergence Network (BcN), the
Radio Frequency
Identification/Ubiquitous Sensor
Internet Protocol version 6 (IPv6)
These networks will become the base
for eight new services: WiBro. Digital
Multimedia Broadcasting, Home
Network Service, Telematics Service,
RFID Application Service, W-CDMA
Service, Terrestrial DTV Service and
Internet Phone (VoIP) Service.

# Appendix B – Summary of Broadband Best Practices

Certain generic approaches and associated best practices for the deployment of broadband case studies are summarised below:

Approach	Best Practice Cases	Target Market	Key Lessons
Voluntary Cooperative	Concord, Massachusetts: OurConcord.Net	Residential	Sufficiently motivated local experts can accomplish a lot, especially in absence of alternatives.
Demand Aggregation	Berkshire County, Massachusetts: Berkshire Connect	SMEs	Need to solicit early support from political leaders to protect against backlash from incumbent.
Entrepreneurs / Innovative Technologies	Aspen, Colorado: Charybdis + Sun Microsystems	Residential	WiFi (802.11b) works in selected environments.
Regional Innovation Networks	Delta Region of Mississippi/Arkansas/ Louisiana	SMEs	High impact from knowledge networking within region across private and public sectors, including government and educational
	Malden, Medford, and Everett, Massachusetts:	R&D Facilities of Large Firms	communities.
Local government	LaGrange, Georgia (Phase I)	BackOffice Firms (e.g. Call centers)	Phased approaches. Start with minimal public sector involvement and only increase as
investment	LaGrange, Georgia (Phase II); Grant County, Washington; Palo Alto, California	Residential	to avoid conflict with private sector, and to achieve realistic budgets.
	Fibre Condominiums in Ottawa, Halifax, Vancouver, and Fredericton, Canada	Public sector communications	
Partnership and Consortia	TeleCom City	Universities, federal and state government agencies, and private companies.	Reposition local economic activity through collaboration to leverage clusters of economic activity.
Unlicensed Wireless	Aspen, Calorado; Burning man Rock Festival, Bhutan; Akwapim Community Wireless Network, Ghana; and Indonesia	Temporary need, Village environment with no other infrastructure; even dense urban areas can benefit.	Wireless solution solves urgent need if unlicensed spectrum is used. This can lead to rapid extension of access and even further policy change at national government level.
Local open access networks	City government of Philadelphia, US City government of Knysna, SA UTOPIA and iProvo Fiber-To-The-Home (FTTH) initiatives in Utah. Zipp Fiber Network in Grant County Washington State. Fiber-To-The-Premise (FTTP) Network - Vasteras, Sweden	Local government & its agencies, Residential, SMEs, Public access points, R&D Facilities of Large Firms	Implement true broadband capacity constrained only by the physical capability of the technology rather than by an artificially imposed business model. Serve local geographic community without encroaching upon trunk and international networks of the conventional telecoms sector The networks serve as a public utility for the information society for public and private, business and residential users. Operated on an open basis owned and controlled independently of any service or content which runs over it thereby allowing choice and facilitating market entry Remove the high fixed costs associated with the need for competitors to deploy their own infrastructure. Legal structure with a corporate governance culture and structure that places emphasis on serving the 'common good'.

### References

- <sup>1</sup> McChesney and Podesta, Washington Monthly, 2006, "Let there be Wi-Fi" January 1, Retrieved January 24, 2007, from http://www.freepress.net/news/13138, last modified January 24, 2007
- <sup>2</sup> "Broadband", Retrieved January 24, 2007 from <u>http://searchnetworking.techtarget.com/sDefinition/0,,sid7\_gci211706,00.html</u> last modified January 24, 2007
- <sup>3</sup> "What is Broadband?". Retrieved January 24, 2007 from http://www.surfmonkey.com/what-is-broadband.htm last modified January 24, 2007
- <sup>4</sup> "Below 256kbps is not broadband" 2005. Retrieved January 24, 2007, from <u>http://infotech.indiatimes.com/articleshow/1055341.cms</u> last modified January 24, 2007
- <sup>5</sup> "Internet World Stats" 2007. Retrieved January 24, 2007, from http://www.internetworldstats.com/stats1.htm last modified January 11, 2007
- <sup>6</sup> Mark, R, September 9, 2004, "FCC Splits on U.S. Broadband Rollout Success" Retrieved January 24, 2007, from <u>http://www.internetnews.com/infra/article.php/3406121</u> last modified January 24, 2007
- <sup>7</sup> Crandall, R W, Hahn, R W & Tardiff, T J, Chapter 13, Pg 305, 'The Benefits of Broadband and the Effect of Regulation' Retrieved January 24, 2007, from http://www.aei-brookings.org/admin/authorpdfs/page.php?id=232
- <sup>8</sup> Malcolm Matson, Rod Mitchell, Rajesh Vasudevan and Charles Watt, " Study On Local Open Access Networks for Communities and Municipalities", The International Bank for Reconstruction and Development / The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.
- <sup>9</sup> UniNet Communications, "Knysna open access network case study", http://www.uninet.co.za
- <sup>10</sup> Committee on Broadband Last Mile Technology, Computer Science and

Telecommunications Board, National Research Council, Broadband: Bringing Home the Bits, National Academy press, National Academy of Sciences (USA), 2002

- <sup>11</sup> D. Atkins, et al., Revolutionizing Science and Engineering through Cyberinfrastructure, Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure, National Science Foundation, 2003.
- <sup>12</sup> Robin E. Mansell, William Edward Steinmueller, Mobilizing the Information Society: strategies for growth and opportunity Oxford University Press,Oxford, 2000

### Glossary

Term	Definition	
3G	Third Generation technology	
ADSL	Asymmetric Digital Subscriber Line	
Backbone network	A backbone network is the top level of a hierarchical communications network. It connects to nodes at lower levels in the hierarchy; backbone networks often exist solely to provide connectivity between lower-level networks.	
Cyberinfrastructure	Similar to roads, electricity, etc., cyberinfrastructure refers to a type of infrastructure consisting of ICTs combined with the personnel and integrating components that provide a long-term platform to empower the modern scientific research endeavour. The term describes the new research environments that support advanced data acquisition, data storage, data management, data integration, data mining, data visualization and other computing and information processing services over the Internet.	
E-inclusion	This refers to activities intended to achieve an inclusive information society by bringing the benefit of the Internet and related technology into all segments of the population.	
E-literacy	E-Literacy is synonymous with Digital Literacy. It is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.	
EBS	Educational Broadcasting System	

EU	European Union
FOSS	Free and Open Source Software
FTTH	Fiber-To-The- Home
FTTP	Fiber-To-The- Premise *Not to be confused with fttp protocol
Gbps	Gigabits per second
GDP	Gross Domestic Product
GGP	Gross Geographic Product
ICASA	Independent Communications Authority of South Africa
ІСТ	Information and Communication Technology
ICTe	Information and Communication Technology and Electronics
IDS	Industrial Development Strategy
ITU	International Telecommunication Union
kbps	Kilobits per second
KZN	Kwazulu-Natal
OECD	Organisation for Economic Cooperation and Development
Open access	Open Access means that anyone, on equal conditions with a transparent relation between cost and pricing, can access and share communication resources on one level to provide value added services to another level in a layered communication system architecture.
	It is a central concept in the ongoing transformation of the communication market from a "vertically integrated" market with a few operators owning and operating everything between the physical medium and the end-user, to an "open horizontal market" with an abundance of actors operating on different levels and providing value added services on top of each other. It places an emphasis on: empowering citizens; encouraging local innovation, economic growth and investment; and getting the best from public and private sector contributions.

OSS	Open Source Software
PGDS	Provincial Growth and Development Strategy
R&D	Research and Development
RFID	Radio Frequency Identification
SANReN	South African National Research Network
SMMEs	Small Medium and Micro Enterprises
USAASA	Universal Service and Access Agency of South Africa
USN	Ubiquitous Sensor Network
WiFi	Wireless Fidelity